

YAMAHA P-450

Natural Sound Belt Drive Turntable

Unique Yamaha Optimum Mass, Minimum Resonance Straight Tonearm

Stable FG Servo Belt Drive System

Fully Automatic Operation

Convenient Front Panel Operation



OWNER'S MANUAL



Thank you for purchasing the YAMAHA P-450 belt drive fully automatic turntable.

This handsome turntable comes with a full range of features for the ultimate in audio performance. It provides exceptionally accurate music reproduction and is very convenient to operate.

Please read these instructions through before operating your model and retain the booklet for reference so as to ensure that you will gain the maximum from your P-450 through many years of use.

CONTENTS

CAUTION: READ THIS BEFORE OPERATING YOUR P-450	3
NAMES OF THE PARTS AND THEIR FUNCTIONS	4
MOUNTING THE TURNTABLE PLATTER AND CARTRIDGE	5
TONEARM ASSEMBLY AND ADJUSTMENTS	6/7
USING THE CUEING SWITCH/DUST COVER/CONNECTIONS TO YOUR AMPLIFIER	8
HOW TO PLAY RECORDS	9
SPECIFICATIONS	10
TROUBLESHOOTING	11

Please record the serial number of your unit in the space below.

Model Name P-450

Serial No.

The serial number is located on the rear of the cabinet.
Retain this Owner's Manual in a safe place for future reference.

WARNING

To prevent fire or electrical shock, do not expose this turntable to rain or moisture.

P-450

CAUTION:
READ THIS BEFORE OPERATING
YOUR P-450

1

The P-450 is a sophisticated fully automatic belt drive turntable. To ensure proper operation for the best possible sound reproduction, please read this manual carefully.

2

Treat the P-450 with the utmost of care, as it is extremely easy to jar fine settings such as tonearm tracking force out of adjustment. If the unit is bumped, it is important that all settings be re-checked.

3

Avoid installing the tonearm side of the P-450 next to the power transformer of your amplifier.

4

Be sure to locate the P-450 in a flat and level place, out of the direct rays of the sun. Also avoid locations subject to vibration and excessive dust, heat, cold or moisture. Also avoid placing it directly in front of or too close to your speakers.

5

If it becomes necessary to relocate the P-450, do so with extreme care. If possible, re-pack the unit in its original packing for transportation.

6

Do not attempt to clean the P-450 with chemical solvents as the unit is coated with a mat lacquer. Use a clean, dry cloth.

7

It is extremely important that the stylus tip be kept free of dirt. Regular cleaning ensures the best possible sound reproduction.

8

Keep your records clean. Dirty records reduce the life of the stylus. A stylus with a diamond tip should be replaced after every 200–300 hours of use.

9

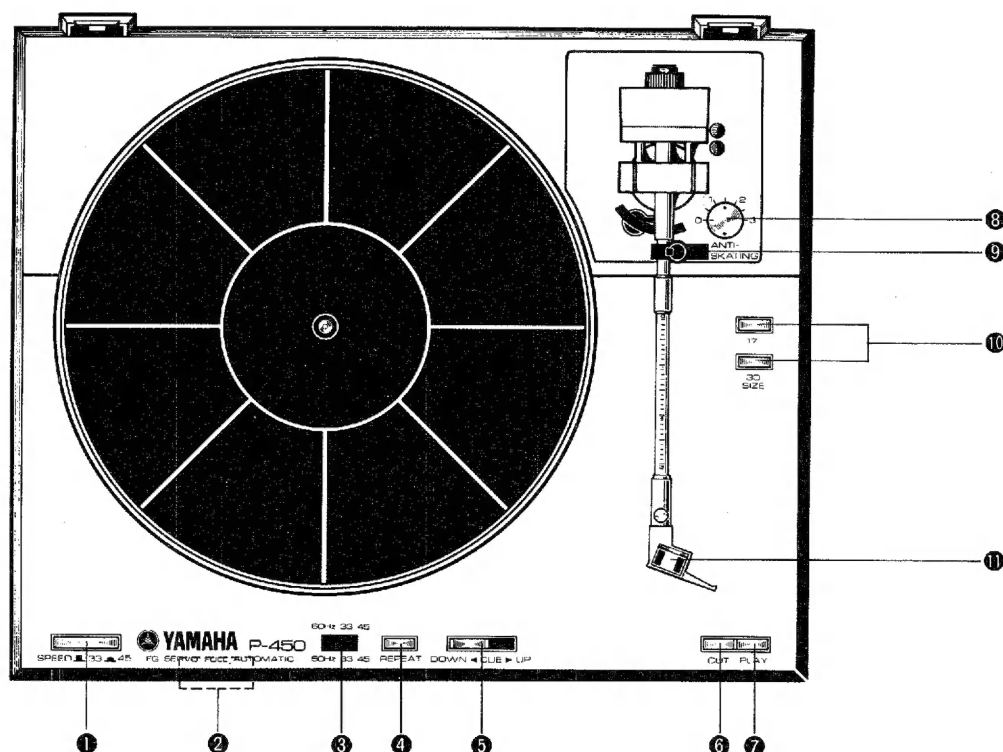
Be sure to read the “troubleshooting” section for advice on common operating errors before concluding that your P-450 is faulty.

10

Keep this manual in a safe place for future reference.

P-450

NAMES OF THE PARTS AND THEIR FUNCTIONS

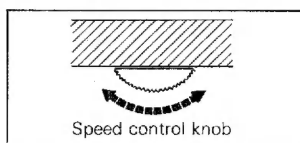


1 SPEED SWITCH

This is used to select the turntable speed.
*When playing a 33-1/3 rpm record, set the switch to "33".

2 SPEED CONTROL KNOB

This gives approximately $\pm 3\%$ adjustment in turntable platter rotation speed (independent for 33-1/3 and 45). Refer to the section on adjusting the platter speed on page 7.



3 STROBOSCOPE

The P-450 features a stroboscope for accurate indication of turntable speed.

4 REPEAT SWITCH

Depress the repeat switch when you want to repeat the same side of the record.

5 CUEING SLIDE LEVER

This is an oil-damped system which gently raises and lowers the stylus from the record surface.

6 CUT SWITCH

Depress this switch when you wish to stop record play. The tonearm will rise and return to the arm rest and the motor will stop.

7 PLAY SWITCH

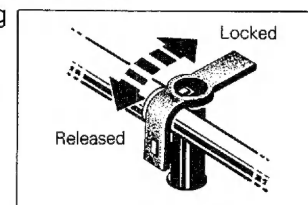
When this switch is depressed, the auto play system is activated. If the cueing switch 5 is in the right-hand position, the stylus will not descend onto the record. For auto play, make sure that the slide lever is in the left-hand position.

8 ANTI-SKATING KNOB

This is a spring-lever type of anti-skating control. Refer to page 7 for adjustment.

9 ARM REST/ARM LOCK

When transporting the turntable, be sure that the tonearm has been secured to the arm rest.



10 RECORD SIZE SELECTOR SWITCHES

Depress the switch that corresponds to the size of record you wish to play. Depress the "30" switch when playing a 30 cm LP and the "17" switch with a single or LP measuring 17 cm.

11 HEADSHELL

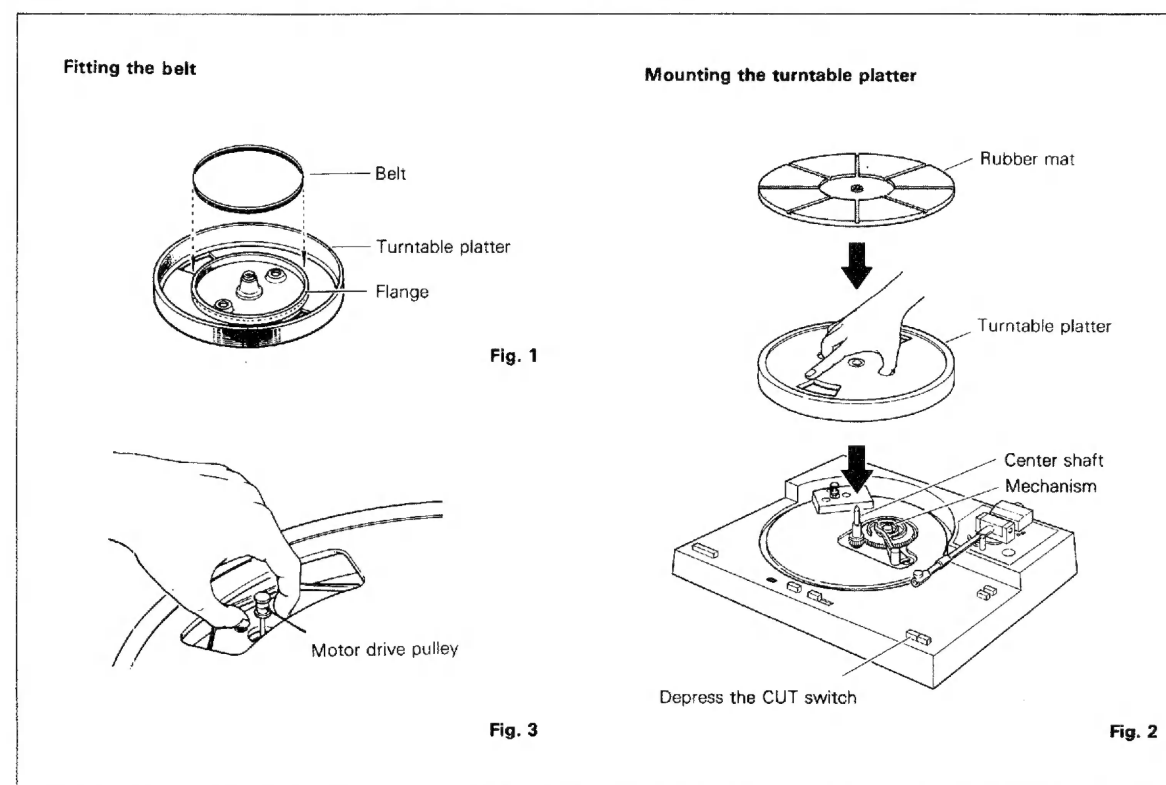
When fitting it into the tonearm pipe, keep it straight and push it into the tonearm end gently so that the connector pins are not damaged in the process.

P-450

MOUNTING THE TURNTABLE PLATTER AND CARTRIDGE

MOUNTING THE TURNTABLE PLATTER

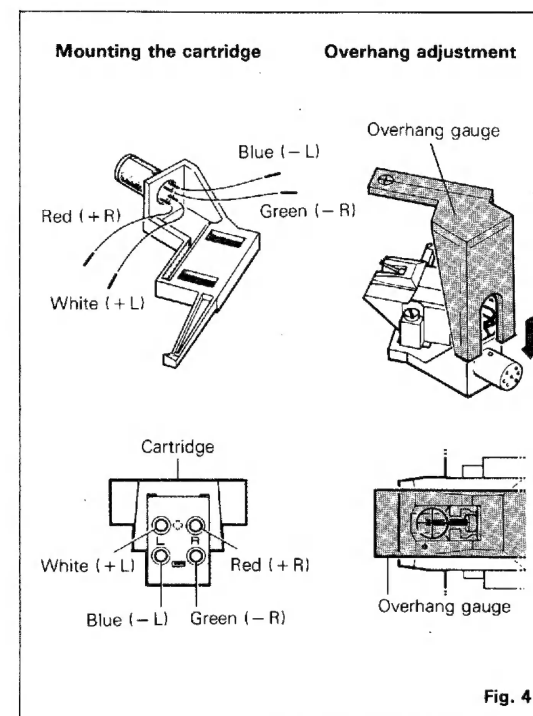
1. Fit the belt provided around the inner flange of the underside of the turntable platter as shown in fig. 1.
2. Insert your fingers into the two holes in the platter as shown in fig. 2 and then slide it gently over the center shaft. (Slip the platter over the shaft securely so that when the platter is rotated, its edge will not move up and down.)
3. Bring the oblong hole in the platter over the motor drive pulley and through this hole fit the drive belt on the pulley (fig. 3).
4. Place the rubber mat on top of the turntable platter.
 - Do not touch any part of the drive mechanism. Once the assembly has been completed, be sure to depress the CUT switch.



MOUNTING THE CARTRIDGE

Cartridges with weights ranging from 2.5 to 10 grams may be used with this turntable.

1. Properly connect the headshell leads to the pins on the cartridge.
2. Loosely mount the cartridge to the headshell with cartridge mounting bolts.
3. Align the stylus with the accessory overhang gauge and after adjusting the overhang, secure the cartridge mounting bolts.



P-450 TONEARM ASSEMBLY AND ADJUSTMENTS

ASSEMBLING THE TONEARM

1. To mount the main weight rotate the black knob in the direction indicated by the arrow in fig. 5.
2. The grooves inside the main weight and the click stopper on the end of the tonearm interlock, thus when the main weight knob is rotated in a counterclockwise direction (as seen from the front of unit) the main weight will smoothly move forward.
3. To mount the headshell, loosen the headshell locking screw and insert the headshell with the phono cartridge in place. Next securely tighten the locking screw. Be sure to keep the headshell straight when inserting it into the tonearm as it is very easy to damage the four contact pins inside the headshell.

Mounting the main weight

- * Be sure that the weight faces the right direction

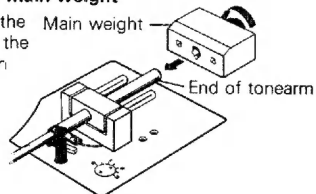


Fig. 5

Mounting the headshell

- Push the headshell straight into the tonearm

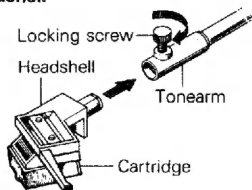


Fig. 6

ADJUSTING TONEARM BALANCE

Proceed with the balance adjustment after mounting and installing the tonearm assembly. Disconnect the power supply to prevent turntable rotation. Also, be sure to set the ANTI-SKATING control to "0".

1. Set the cueing slide lever to the left-hand position (tonearm is "DOWN") and depress the arm lifter.
2. Align the front side of the tracking force adjustment weight with the "0" line on the tonearm.

3. First release the arm lock. Then bring the tonearm away from the arm rest.
4. Carefully release the finger hook and check to see if the tonearm is horizontally balanced.
5. Adjust the main weight until the tonearm is in a perfectly horizontal position.
6. Once the tonearm has been balanced, return it to the arm rest.

Balance adjustment

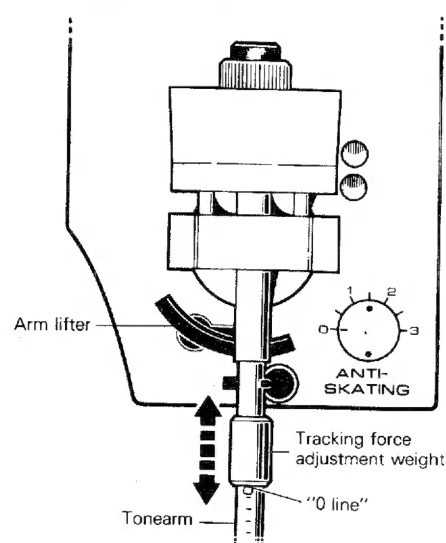


Fig. 7

Headshell is too heavy
(rotate the black knob in the direction of the arrow)



Rear assembly is too heavy
(rotate the black knob in the direction of the arrow)



Tonearm is balanced perfectly

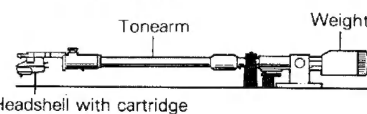
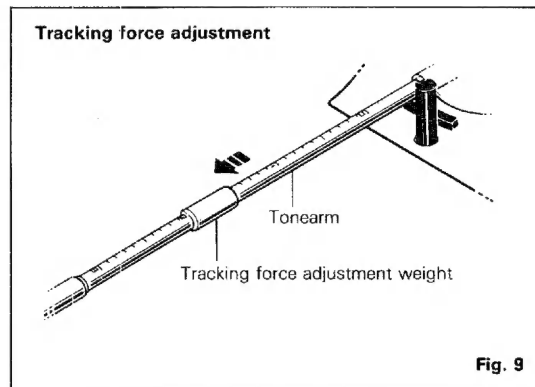


Fig. 8

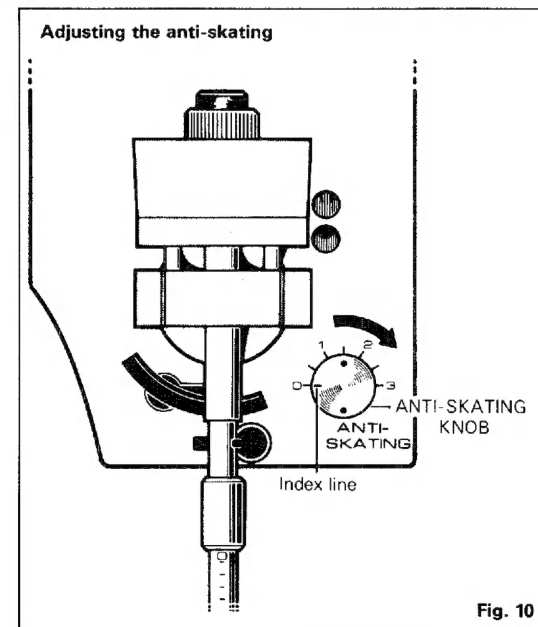
ADJUSTING CARTRIDGE STYLUS TRACKING FORCE

1. Make sure that the position of the main weight does not move once the tonearm has been horizontally balanced.
2. Move the tracking force adjustment weight along the tracking force scale on the tonearm until it corresponds with the rated tracking force of your cartridge.



ADJUSTING THE ANTI-SKATING

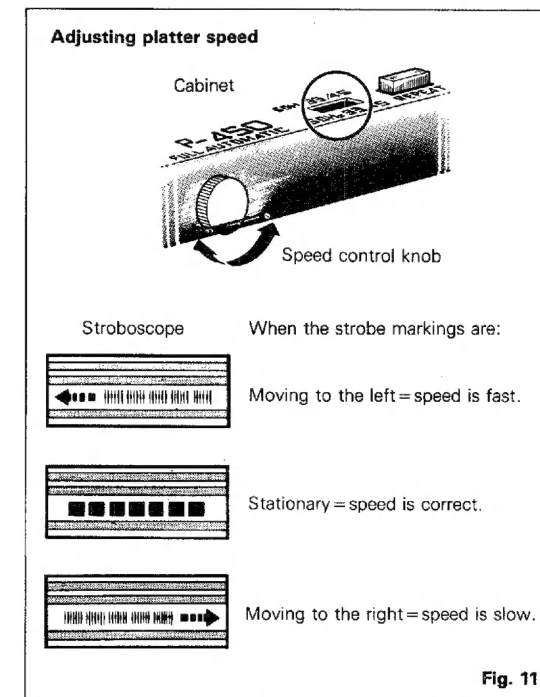
Align the index line on the anti-skating knob with the scale marking which corresponds to the rated tracking force of your cartridge.



ADJUSTING PLATTER SPEED

Observe the stroboscope, and adjust the speed control knob at the bottom of the cabinet so that the stripe matching the power line frequency in your area appears to stand still.

The speed control knob permits an adjustment of up to $\pm 3\%$ in speed.
 *In some cases the stroboscope stripe will appear to move slightly. This is caused by small fluctuations in the power line frequency and does not mean that something is wrong with the turntable.



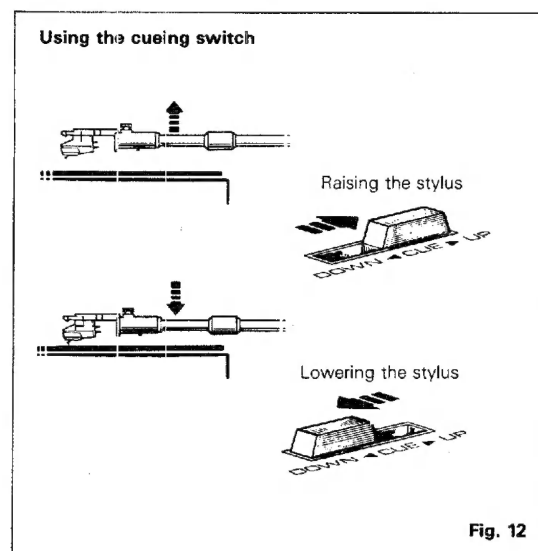
P-450

USING THE CUEING SWITCH/ DUST COVER/CONNECTIONS TO YOUR AMPLIFIER

USING THE CUEING SWITCH

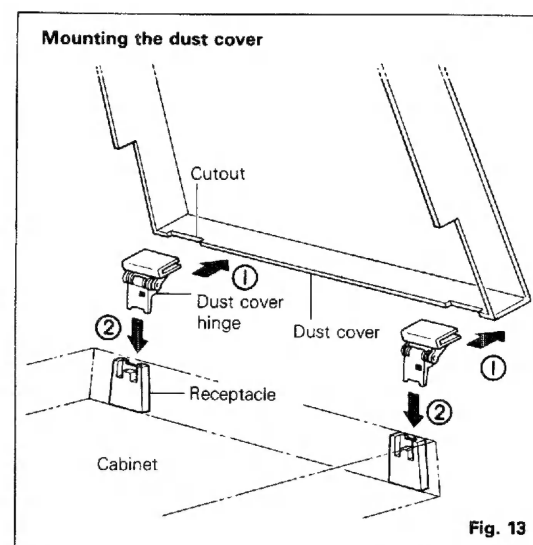
In normal operation the cueing switch is set in the left-hand position. However, if you wish to interrupt record play in order to play a different track, the cueing switch can be used to gently raise and lower the stylus.

1. Raising the stylus:
Slide the cueing switch to the far right. The stylus will immediately rise from the record.
2. Lowering the stylus:
Slide the cueing switch to the far left. The stylus will now descend onto the record and play will begin.



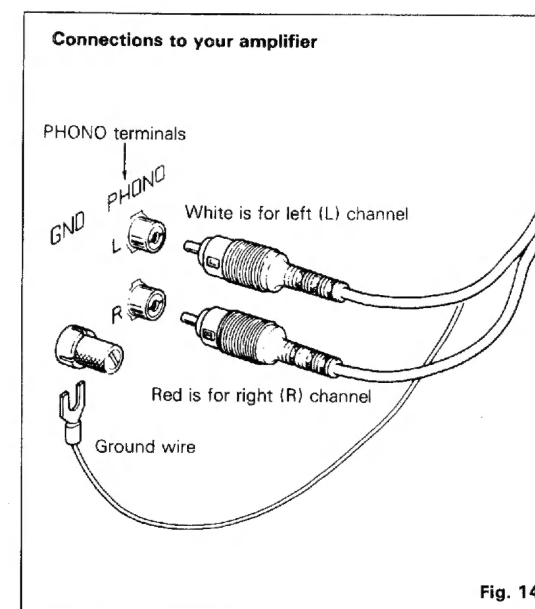
MOUNTING THE DUST COVER

1. Fit the dust cover hinges into the two cutouts at the rear of the dust cover, as shown in fig. 13, and slide them into place. (Arrow 1)
2. Next, simultaneously insert the two hinges into the left and right receptacles on the rear of the cabinet. (Arrow 2)
3. It is possible to remove the dust cover. To remove, follow the above procedure in reverse.



CONNECTIONS TO YOUR AMPLIFIER

1. Connect the output cords from the rear panel of the cabinet to the PHONO terminals on the audio amplifier. Make sure that the left and right channels are properly matched. The white cord signifies left (L) channel and the red the right (R) channel.
2. Connect the black ground wire to the GROUND (GND) terminal on the audio amplifier. Depending on the amplifier, better sound is sometimes obtained by not connecting the ground wire.
3. Connect the power plug to the AC wall outlet or to an auxiliary outlet on the audio amplifier.



P-450

HOW TO PLAY RECORDS

PLAYING RECORDS

After you have assembled the turntable, made the necessary adjustments and connected the turntable to the audio amplifier, you are ready to start playing records. Proceed as follows.

1

Check to make sure that the turntable, amplifier and speaker connecting cords have been inserted into the correct terminals.

- The power cord should be plugged into an AC power outlet or into the audio amplifier's auxiliary power outlet.
- If you are using the ground wire, check to see that it is securely fastened to the amplifier's GND terminal.

2

Switch on the amplifier

- Set the input selector switch to PHONO. Lower the volume control.

3

Place your selected record on the turntable platter and set the record size selector switch to the size of the record.

- When playing 45 rpm singles, slip the accessory 45 adaptor over the center shaft.

4

Set the SPEED switch so that it corresponds to the rated speed of the record.

5

Make sure that the cueing switch is in the far right position (stylus up position).

6

Remove the stylus cover.

7

Remove the arm rest lock and depress the PLAY switch. Record play will start automatically.

8

Record play

- Adjust the amplifier's volume and tone controls to your own preferred levels.

9

Once record play has been completed, the tonearm will automatically rise and return to the arm rest and the platter will stop rotating.

- Depress the CUT switch if you want to stop record play.
- Operate the cueing switch (refer to page 8) if you want to interrupt record play.
- If the REPEAT switch has been activated, the unit will indefinitely repeat the same side of the record. Even if the CUT switch is depressed, play will resume again.

P-450 SPECIFICATIONS

TURNTABLE MOTOR SECTION

Drive System	FG servo belt drive
Motor	DC servo motor
Platter	30 cm (12") diecast aluminum, 0.7 kg (1 lb. 9 oz.) (including rubber mat)
Moment of Inertia	110 kg·cm ² (including rubber mat)
Speed	33-1/3 and 45 r.p.m.
Speed Variation	± 3% (Independent for each speed)
Signal-to-Noise Ratio	Better than 70 dB (DIN-B, IEC 98A wtd)
Wow and Flutter	Less than 0.04% WRMS

TO NEARM SECTION

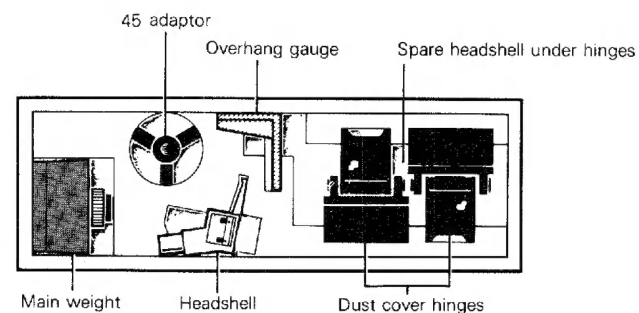
Arm Type	Straight arm
Tonearm Total & Effective Length	290/222 mm (11-13/32" / 8-3/4")
Overhang	16 mm (5/8")
Tracking Force	Static balanced, sliding weight 0—3 g, 0.1 g steps
Effective Mass	11 g (without cartridge)
Horizontal Tracking Error	— 1° to 3°
Anti-Skating	Spring type
Offset Angle	23°
Arm Lifter	Oil damped system
Sensitivity	Vertical 10 mg, Horizontal 30 mg
Permissible Cartridge Weight	2.5—10 g
Headshell	Resin, 20% carbon fiber Weight 2.8 g
PU Cable Capacitance	100 pF
Resistance	1 Ω

GENERAL

Power Supplies	120 V AC 60 Hz
Power Consumption	3 W
Cabinet	BMC (Bulk Molding Compound)
Dust Cover	Removable, transparent
Hinges	Free-setting, detachable
Dimensions (W x H x D)	440 x 132 x 372 mm (17-3/8" x 5-1/8" x 14-5/8")
Weight	5.0 kg (11 lbs.)

Specifications subject to change without notice.

ACCESSORIES



P-450 TROUBLESHOOTING

Before assuming that your turntable is faulty, check the following troubleshooting list which details the corrective action you can take yourself without having to call a service engineer. If you have any doubts or queries, get in touch with your nearest YAMAHA dealer.

Fault	Cause	Cure
Platter does not rotate, although PLAY switch is depressed.	Power cord is not firmly plugged into AC power outlet or into auxiliary power outlet of amplifier.	Connect the power cord securely to the AC power outlet or to the amplifier's auxiliary power outlet.
Platter rotation is too slow (or too fast).	Speed is not adjusted properly.	Refer to page 7 and adjust the speed.
	Stroboscope has not been observed properly.	Check the frequency and the speed by the stroboscope display and adjust.
Tonearm is not properly balanced when cartridge is replaced.	The cartridge is either too heavy or too light.	The proper cartridge weight ranges from 2.5 to 10 grams. If the weight of the cartridge used is within this range, slide the weight to the front or rear and re-adjust.
Tonearm does not descend to the record surface.	Cueing switch is in the UP position.	Set the cueing switch to DOWN position.
There is no sound or low sound although the stylus descends to the record surface.	Defective contact of headshell connector pins.	Mount the headshell firmly onto the tonearm.
	Amplifier's function switch is not set to PHONO.	Set the function switch to PHONO.
	Amplifier's volume control is at lowest position.	Turn up the volume control to the required position.
	Defective connection of turntable's output cords.	Check the connecting terminals on the rear panel and amplifier.
The body of the cartridge catches on the record surface.	Tracking force is too high.	Re-adjust to the proper tracking force.
Reproduced sound is distorted and unpleasant, particularly the treble, with a clicking or scraping noise.	Turntable is not set horizontally.	Install the turntable horizontally.
	Dust on stylus.	Clean the stylus with a stylus cleaning brush.
	Worn stylus.	Replace the stylus.
	Damaged or dusty, dirty record.	Replace with a new record.
	Tracking force is either too high or too low.	Readjust the tracking force for the cartridge to the recommended value.
	Amplifier's treble control is turned up too high.	Try returning the treble control to the FLAT position.
Reproduced sound quivers and a howl (acoustic feedback) is heard.	Installation locations of speaker systems and turntable are too close together or turntable is unstable and vibrations are being transmitted to cause resonance.	Move the turntable to a stable location, move it some distance from the speakers, or change the speaker locations (in particular, avoid installation in corners).
A loud humming sound is heard during record play.	Turntable's ground wire is not connected to amplifier's ground terminal.	Connect the ground wire to the ground terminal. (Sometimes a better effect can be obtained by not connecting this wire, however.)
	Defective contact of headshell connector pins.	Mount the headshell properly onto the tonearm.



CAUTION

: Read both this leaflet and the OWNER'S MANUAL carefully to get the best performance from this appliance.

- 1** Read Instructions — All the safety and operating instructions should be read before the appliance is operated.
- 2** Retain Instructions — The safety and operating instructions should be retained for future reference.
- 3** Heed Warnings — All warnings on the appliance and in the operating instructions should be adhered to.
- 4** Follow Instructions — All operating and use instructions should be followed.
- 5** Water and Moisture — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.
- 6** Carts and Stands — The appliance should be used only with a cart or stand that is recommended by the manufacturer.
- 7** Wall or Ceiling Mounting — The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
- 8** Ventilation — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
- 9** Heat — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
- 10** Power Sources — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
- 11** Grounding or Polarization — The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
- 12** Power-Cord Protection — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
- 13** Cleaning — The appliance should be cleaned only as recommended by the manufacturer.

14 Nonuse Periods — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

15 Object and Liquid Entry — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

16 Damage Requiring Service — The appliance should be serviced by qualified service personnel when:

A. The power-supply cord or the plug has been damaged; or

B. Objects have fallen, or liquid has been spilled into the appliance; or

C. The appliance has been exposed to rain; or

D. The appliance does not appear to operate normally or exhibits a marked change in performance; or

E. The appliance has been dropped, or the enclosure damaged.

17 Servicing — The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

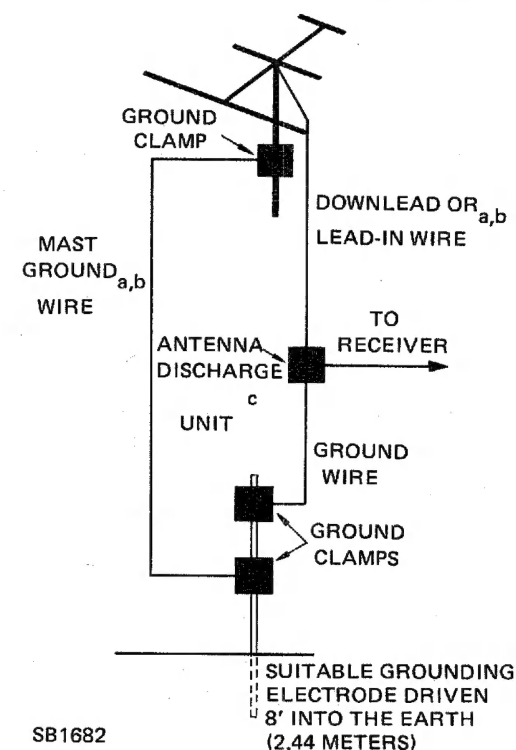
18 (Applicable to the Tuner and Receiver.)

Power Lines — An outdoor antenna should be located away from power lines.

19 (Applicable to the Tuner and Receiver.)

Outdoor antenna grounding — If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70—1978, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

EXAMPLE OF ANTENNA GROUNDING AS
PER NATIONAL ELECTRICAL CODE INSTRUCTIONS



a Use No. 10 AWG copper or No. 8 AWG aluminum or No. 17 AWG copper-clad steel or bronze wire, or larger as ground wires for both mast and lead-in.

b Secure lead-in wire from antenna to antenna discharge unit and mast ground wire to house with stand-off insulators, spaced from 4 feet (1.22 meters) to 6 feet (1.83 meters) apart.

c Mount antenna discharge unit as closely as possible to where lead-in enters house.

This leaflet has been prepared according to UL regulation 1270.

SINCE 1887  **YAMAHA**
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN
Printed in Japan 804 ⑤